Plant Health Centre
Scotland's Centre of Expertise

Economic Impact of Pesticide Withdrawals with case studies

19 March 2021

PHC Sector lead Agriculture: Professor Fiona Burnett

Scotland's Rural College (SRUC)

Introduction

Plant Health Centre
Scotland's Centre of Expertise

1. Pesticides widely used in Scottish agricultural, horticultural and forestry, amenity and natural environment
2. Availability and use closely regulated
3. From 1st January 2021, the UK has introduced an independent regulatory regime. The Health and Safety Executive (HSE) is the national regulator for the whole of the UK, on behalf of each of the four country administrations.
4. Withdrawals may lead to reduced output value and costs may also increase
5. Potential impacts are of policy interest given objectives relating to vibrant rural economies, increased afforestation, and growth of the food and drink sector - balanced against policy interests to protect human and environmental health.

Understanding the likely magnitude and distribution of potential impacts, but also how they may be mitigated.

Plant Health Centre
Scotland's Centre of Expertise

PHC2018/15: Potential Impacts Arising From Pesticide Withdrawals To Scotland's Plant Health

Author: Andy Evans

PHC2020/09: Economic Impact Of Pesticide Withdrawals To Scotland, With Case Studies

Authors: Mark Bowsher-Gibbs, Fiona Burnett, Donald Dunbar (edited by Andrew Moxey)

Methods

- Scottish pesticide use data to identify the most frequently used active substances (SASA , FR and HSE)
- Active substances of greatest importance to each sector assessed
- Cross-referenced with an analysis of active substances at risk provided by SASA and database maintained AHDB.
- Actives graded as at low, medium or high risk of withdrawal
- Industry-generated UK evidence of upper-bound impacts on total value of output used to frame the impact of pesticide losses.
- To weight these impacts to Scottish risks consulted with key stakeholders listed in the acknowledgement section to amend economic loss estimates accordingly.

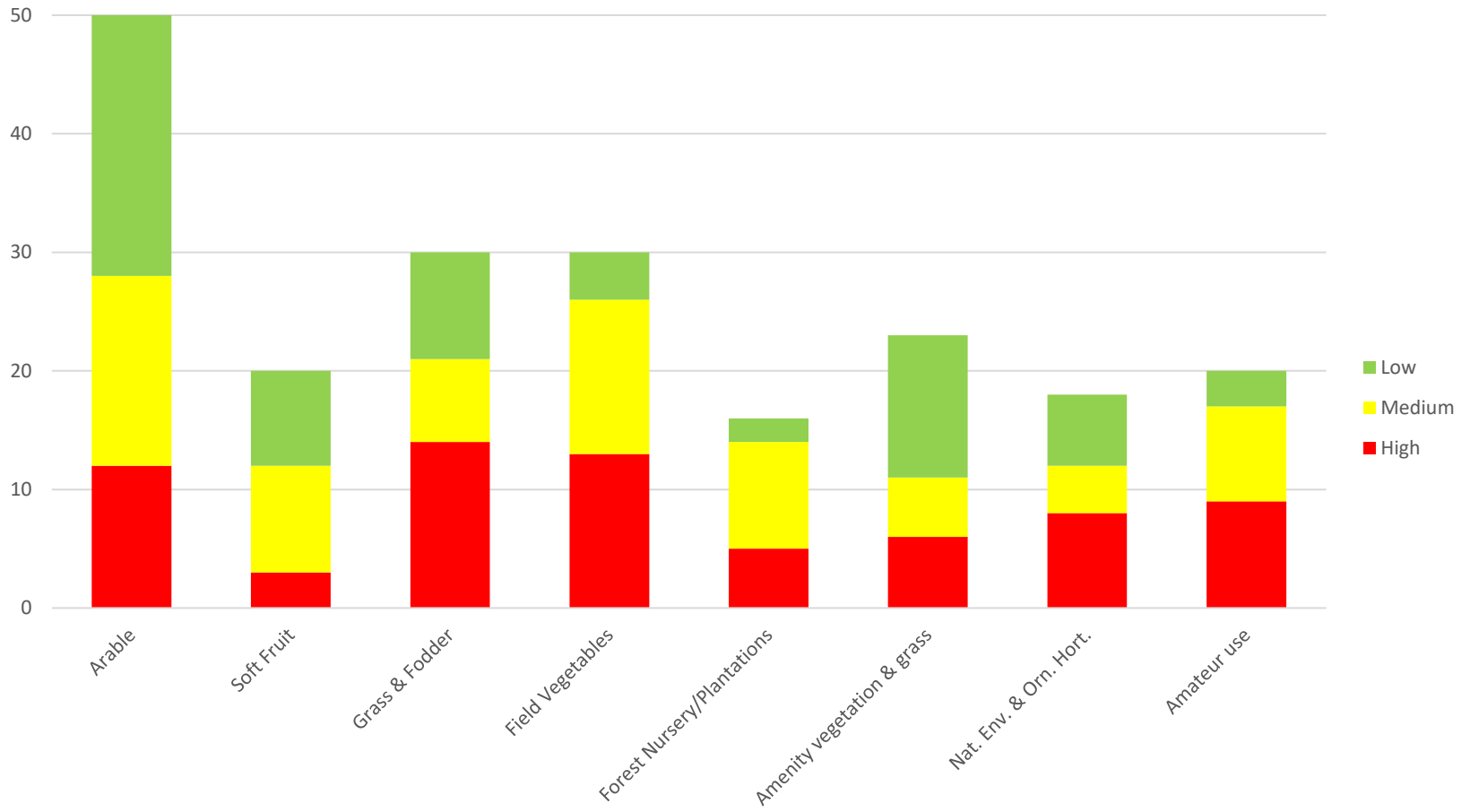
- Second report considers mitigating adaptations taken up by Scottish growers and sets out other considerations
- Findings and recommendations

Plant Health Centre
Scotland's Centre of Expertise

All sectors

Number of commonly used active substances estimated to be at low, medium and high risk of withdrawal

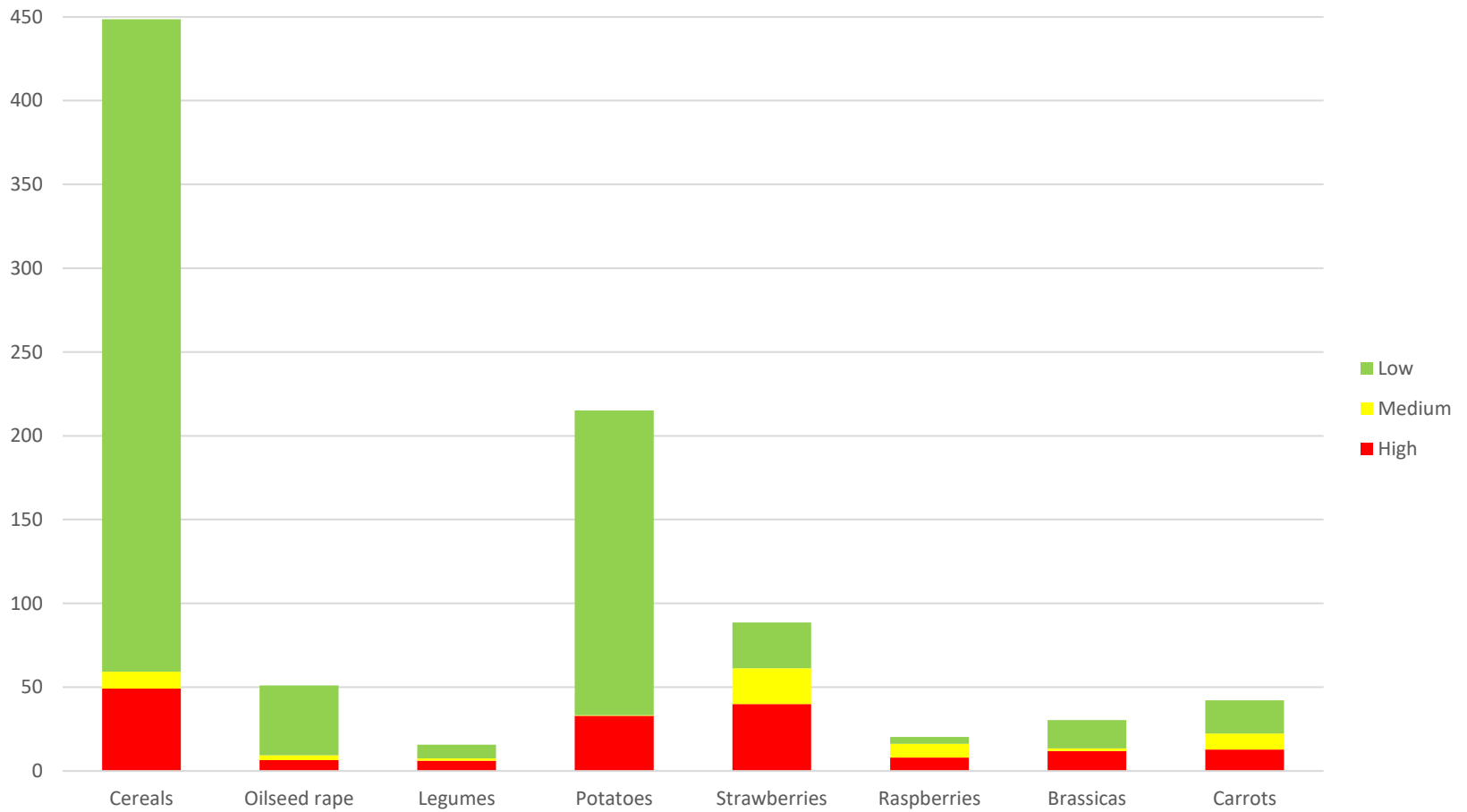
Plant Health Centre
Scotland's Centre of Expertise



Agriculture

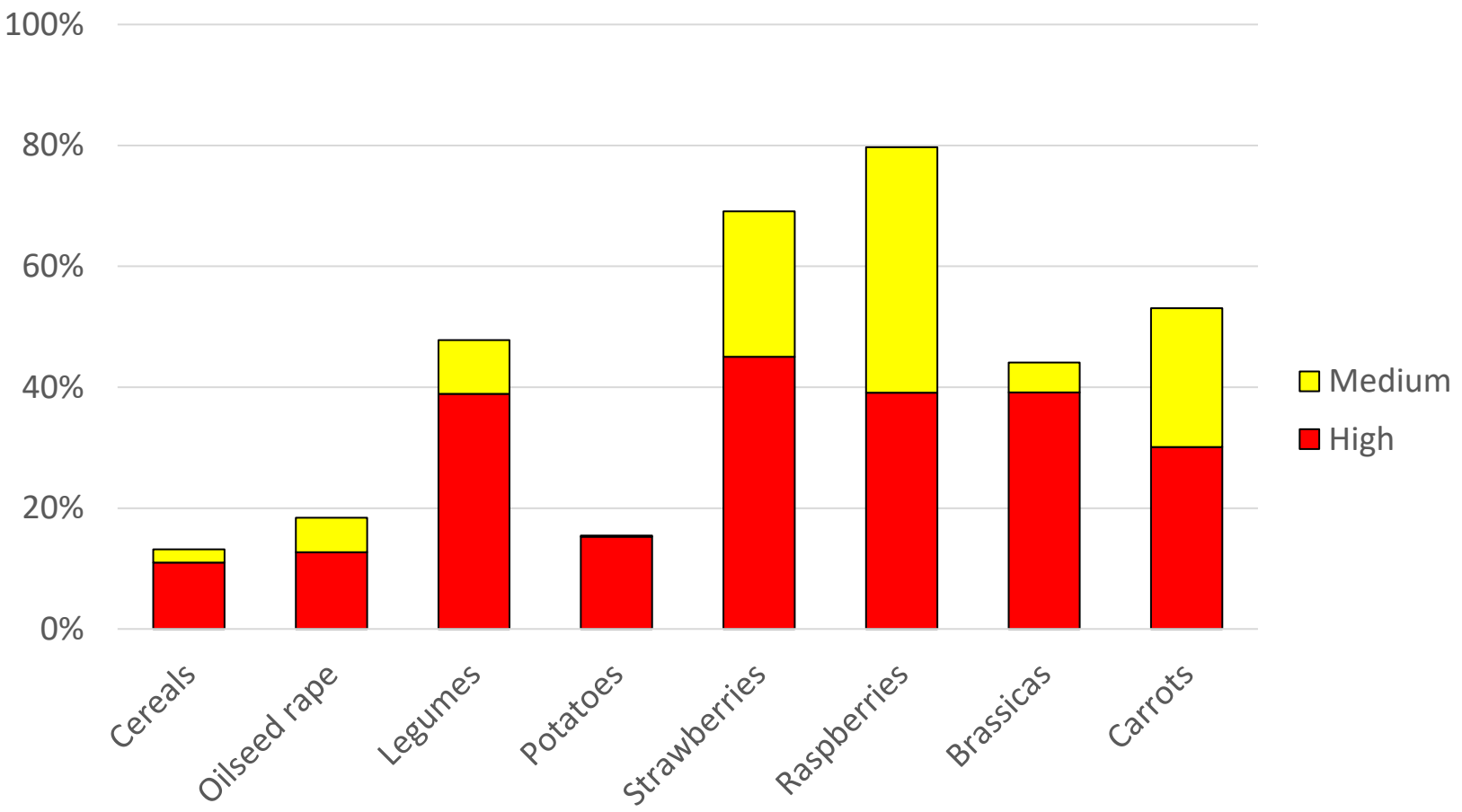
Estimated impact on output value (£M reduction) of withdrawal of all currently used active substances, by risk category, by Scottish commodity sector

Plant Health Centre
Scotland's Centre of Expertise



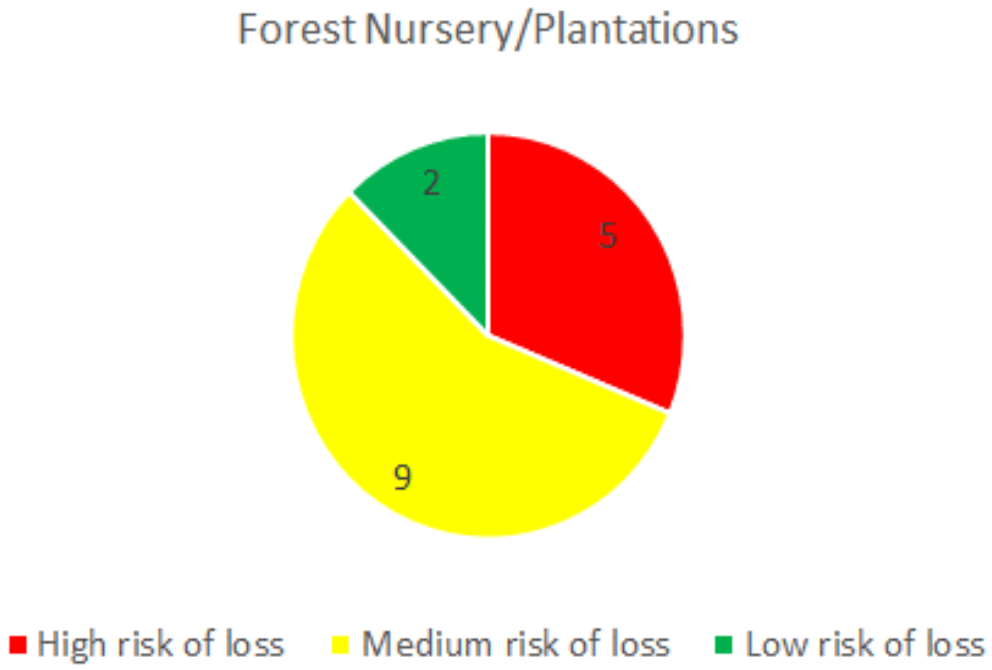
Estimated impact on output value (% reduction) of withdrawal of currently used active substances at high or medium risk, by Scottish commodity sector

Plant Health Centre
Scotland's Centre of Expertise



Forestry

Active substances (n=16) at High, Medium or Low risk



GVA for the forestry sector in Scotland is £954M

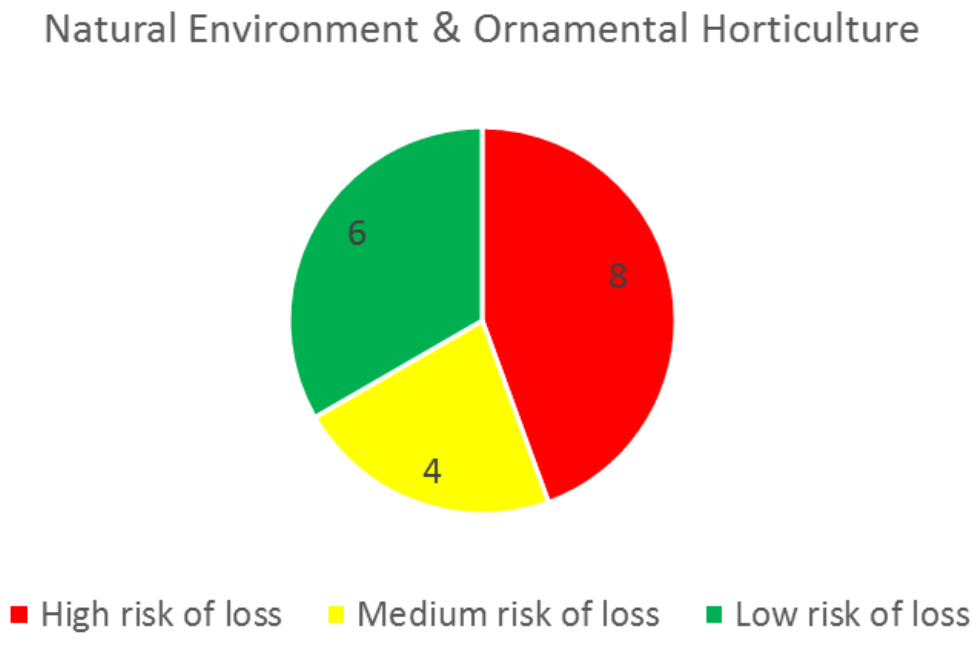
- Withdrawal of cypermethrin and alpha-cypermethrin for pine weevil management estimated as 1% reduction in value ~ £9.54M.
- Estimates of between £4M directly and £40M indirectly have been made at the UK level.
- Alternatives are the neonicotinoid active substance acetamiprid and the use of entomopathogenic nematodes.
- Withdrawal of propyzamide ~ 1% reduction in value. £9.54M. Potential withdrawal of glyphosate would exacerbate.

Forest nursery sector, difficult to put financial figures on potential losses

- Withdrawal of cypermethrin and alpha-cypermethrin impact on the survival of young
- Alternatives limited / Minor Use (EAMUs)
- Expensive, or require a greater shift into the use of biological pesticides / adoption of integrated approaches

Natural environment and ornamental horticulture

Active substances (n=18) at High, Medium or Low risk



Ornamental horticultural

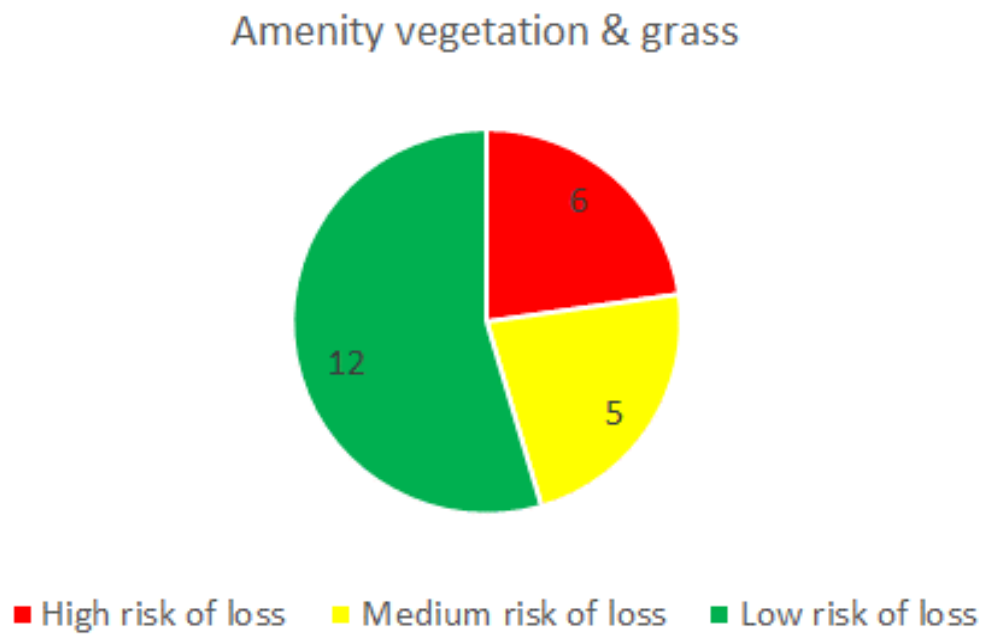
- Withdrawal risks - mancozeb (for botrytis and downy mildew management), confirmed loss of thiacloprid (aphids, beetles and whitefly), pymetrozine (aphids) and diquat (weeds), cypermethrin (aphids and other insect pests), glyphosate and propyzamide (weeds) and spinosad (thrips).
- Withdrawal of active substances coupled with a reduction in the current Extensions of Authorisations for Minor Use would have a significant impact
- Increased the risk of disease and pest resistance within this intensively managed sector.
- Increased uptake of the available biological pesticides is likely, but with increased costs to the grower and the consumer

Natural environment

- Main uses around control of invasive species. Glyphosate and Azulox

Amenity

Number of widely used active substances (n=23) at High, Medium or Low risk



- Aesthetic improvement, management of conservation areas, invasive species, flood risks, public safe access, use of sporting facilities and public spaces.
- No marketed output so financial value hard to attribute
- Oxford Economics 2017- ban on glyphosate for weed management in the amenity sector would add at least £228 million to the UK's council tax bill pa, and add £7.80 to average household council tax bill

Initial recommendations

Plant Health Centre
Scotland's Centre of Expertise

- Increased promotion and support for uptake of Integrated Pest Management
- Particular consideration of impacted sectors like soft fruit, vegetable and ornamental production
- Steward and conserve active substances
- Increased requirement for training, knowledge exchange and advice to mitigate plant health losses and facilitate the rapid uptake of alternative / integrated solutions across all sectors.

Report 2

- Risk of withdrawal varies across different active substances and sectors, and is not static
- Timing varies - estimated upper-bound impacts would not be felt immediately.
- Staggered phasing of withdrawals offers time for adaptative management

Other considerations

Plant Health Centre
Scotland's Centre of Expertise

1. Tightening of regulatory controls on pesticides is not restricted to the UK so Scottish users will not necessarily be placed at a competitive disadvantage
2. Estimated impacts on output value may be offset to some extent by market-level dynamics. Much depends upon implementation of the Trade and Cooperation Agreement with the EU and other post-Brexit trade arrangements between the UK and other countries in terms of production standards and tariff protections
3. UK imports of oilseed rape from countries such as Australia and Ukraine where neonicotinoids are still permitted illustrates this point starkly
4. Even if estimated upper-bound impacts are realised, this overstates the overall economic loss since at least some of the land, labour and capital displaced from current production would, over time, be reallocated to other uses. This transition would be locally disruptive and might hamper achievement of some specific stated policy objectives but would not necessarily result in lower overall economic activity at the national level.

Main adaptations made or anticipated by Scottish growers and agronomists.

Active ingredient	Main adaptation and comment
Clothianidin & Thiamethoxam	Pyrethroid sprays Multi-sector disruption (oilseed rape, sugar beet) Calls for adaptation of current legislation to help mitigate disruption. Pressures currently low in Scotland but expected to increase.
Clorpyrifos	Pyrethroid sprays Increasing uptake of other chemical control options Non-chemical options more suited to amenity sector / controlled environment crops Development timescales for alternative leave industry devoid of short-term solutions
Diquat	Flailing (significant extra cost, increased operational emissions, a higher percentage of in-field area uncropped, possible spread of bacterial diseases) Pre-emergence herbicide alternatives – add cost and reduced application flexibility. Absence may disincentivise growers of seed crops, pulses, and legumes as rotational options - not yet translated into reduced planting areas which should be monitored going forward.
Linuron	Alternative chemical options, with lower efficacy than linuron and carrying a greater risk of crop damage with narrower application opportunities. An example of where a rapid withdrawal exposes industry to loss ahead of new product evolution.

Impact mitigations

1. Mitigations to date have mainly been reactive to withdrawals
2. Limits to mitigation effectiveness - withdrawal of neonicotinoids has significantly reduced overall production of oilseed rape across Europe. Implications for the viability of processors and has led to surges in imports, primarily from production expanding in countries where neonicotinoids are still permitted - implies global neonicotinoid usage may not be declining, and highlights complexities associated with standards and international trade.
3. Scottish oilseed rape producers are currently less exposed to Cabbage Stem Flea Beetle risks than English counterparts but climate change may change this.
4. Adoption of alternative control measures can add to fossil fuel usage – eg Diquat
5. Reduced viability of enterprises such as oilseed rape, sugar beet, potatoes and legumes limits rotational control measures.
6. Difficulties in upscaling some alternative biological solutions
7. Above examples confirm the difficulties encountered by sectors reliant on key active substances if like-for-like alternative control measures are not readily available.

Conclusions

1. Calculated impact estimates represent upper-bounds under specific scenarios and actual impacts could be mitigated by staggered withdrawals over time, market-level adjustments, and the adoption of alternative management practices
2. Wider uptake of IPM could reduce reliance upon pesticides but also potentially, prolong regulatory approval of at least some active substances.
3. Such an approach might help to balance policy interests to protect human and environmental health whilst maintaining commodity production and employment in rural sectors.

For consideration

1. Prolong the availability of key active substances, where environmental and health impacts allow
2. Accelerating R&D efforts and support adaptive management at the farm-level to discover and implement alternative control measures.
3. Explicit support, including advice, training and funding on IPM, for resistant plant varieties, biological controls, habitat manipulation and enhanced planning and monitoring
4. Include strategic stewardship of active substances as part of a broader approach to controlling plant damage.
5. Current policy encouragement for IPM is comparatively light-touch – expand to include all sectors and strengthen to include the provision of advice and training, grant-aid for relevant capital investment and research and development, and conditionality obligations to deploy elements of IPM (alongside other possible future compliance requirements such as carbon, nutrient and biodiversity planning).
6. Specific attention to sectors more exposed to withdrawal risks

High scoring farms

Plant Health Centre
Scotland's Centre of Expertise

- Clear link between familiarity with IPM and higher scores
- KE and information source important
- Open days and trial events
- Discussion groups
- Engagement with independent agronomists

- Published literature most trusted / not highly read
- Twitter least trusted /least read
- One to one from trusted sources favoured

Learning together: a report on knowledge production, exchange and implementation for plant health across people in Scotland Authors:- Henry Creissen, Althea Davies, Robbie Fitzpatrick, Mariella Marzano, Elliot Meador, James Robinson, Rehema White. https://www.planthealthcentre.scot/projects

Views on

- Phased withdrawal
- Acceleration of alternatives
- Active stewardship
- Commitment to vulnerable sectors
- Wider benefits (or costs) of withdrawal to environment
- Help with IPM+ measures
- KE, skills and information

Forestry

Agriculture

Environment

Horticulture

www.planthealthcentre.scot
Twitter: @PlantHealthScot
Email: info@planthealth.scot

Plant Health Centre
Scotland's Centre of Expertise

BioSS
The University of Edinburgh
Royal Botanic Garden Edinburgh
University of Strathclyde Glasgow
SRUC
University of Exeter
The James Hutton Institute
Forest Research
CEH Centre for Ecology & Hydrology
Natural Environment Research Council